FIRE WEATHER OPERATIONS PLAN FOR MAINE AND NEW HAMPSHIRE 2008

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1.0 Introduction

The National Weather Service (NWS) Forecast Office in Gray will provide fire weather support for the Southwestern half of Maine, and all of New Hampshire except Cheshire and Hillsborough counties. The NWS office in Caribou will provide fire weather service for Northeastern Maine. Each forecast office will generally be responsible for the fire weather forecast within their county warning area (CWA). Fire weather zones do not necessarily correspond exactly to NWS public forecast zones (PWMZFPGYX and PWMZFPCAR).

A general Fire Weather Forecast (FWFGYX) for the CWA will be issued daily during the fire weather season by the forecast offices in Gray and Caribou. Also, SPOT forecasts for wildfire support will be available throughout the year, 24 hours a day from the above mentioned forecast offices.

The NWS cannot provide formal SPOT forecasts for non-wildfire situations, such as prescribed burns and smoke management, for non-federal areas.

This Operations Plan will explain the types of information available for Fire Weather support and the sources of this information.

This plan will be reviewed annually by all parties. Proposed changes to this plan will be approved by all parties before such changes are implemented.

2.0 Forecast Areas

In Maine, the fire weather area of responsibility is divided among the offices in Gray and Caribou. Gray is responsible for southwestern Maine while Caribou is responsible for northern and eastern Maine. In New Hampshire, the fire weather area of responsibility is divided among the offices in Gray and Taunton MA, with Gray responsible for all but the southwestern counties of Cheshire and Hillsborough, which Taunton is responsible for.

3.0 Fire Season

The normal fire season for the Gray County Warning Area (CWA) will extend from April through November, but is highly dependent on when winter snow cover ends and begins respectively. For this reason, the beginning and ending of the fire weather season will always be coordinated with the state forest departments and adjacent NWS forecast offices.

4.0 Fire Weather Forecast

The NWS forecast office in Gray will issue the fire weather forecast under the header PWMFWFGYX.

The fire weather forecast issued by the Gray office will be for the following counties:

In Maine: York, Cumberland, Oxford, Androscoggin, Franklin, Somerset, Kennebec, Waldo, Lincoln, Sagadahoc and Waldo.

In New Hampshire: Coos, Grafton, Carroll, Sullivan, Merrimack, Belknap, Strafford and Rockingham.

The Fire Weather Forecast will cover specific conditions for the next two days and will consist of three or four 12-hour periods. The morning FWF will consist of three 12-hour periods (today, tonight, tomorrow). The afternoon FWF will consist of four 12-hour periods (tonight, tomorrow, tomorrow night, following day). The product will contain a general 3 to 7 day extended forecast for the CWA.

The forecast is based on NWS computer generated guidance in and around the CWA. It's important to note that the computer generated forecast is a first guess and should be tailored to match zone forecasts and the specified allowable ranges of relative humidity and wind.

The fire weather product will include the following information:

1) A headline for red flag warnings, fire weather watches, or the most pertinent weather elements of the day.

2) A brief non-technical synopsis of important weather systems.

3) Forecast elements for each zone grouping.

4) Extended forecast (including an 8 to 14 day outlook).

4.1 Issuance Time

The Fire Weather Forecast (FWF) will be issued twice daily. The morning FWF should be issued by 600 am, and the afternoon should be issued by 400 pm. The FWF will be updated as conditions warrant.

4.2 Elements

Most elements contained within the fire weather zone product will be directly derived from: 1) public zone parameters from the Graphical Forecast Editor (GFE) girds within the Advanced Weather Interactive Processing System (AWIPS), and 2), model soundings.

a) CLOUD AMOUNT

A. Clear -- Little or no cloud cover.
B. Partly cloudy (Sunny) -- 1/10th to 5/105ths of the sky covered with clouds.
C. Mostly Cloudy -- 6/10ths to 9/10ths of the sky covered with clouds.
D. Cloudy -- The entire sky is covered with clouds.

b) CHANCE OF PRECIPITATION

The chance of measurable precipitation (0.01 inch liquid equivalent or more) within each zone for every 12 hour period. Values range from 0% to 100% (measurable precipitation certain to occur).

c) PRECIPITATION TYPE

Rain, rain showers, thunderstorms, snow, and snow showers will be the most commonly forecasted precipitation types within the fire weather zone forecast.

d) MAX/MIN TEMPERATURE

The temperature will be in degrees Fahrenheit. The maximum temperature is for 7am to 7 pm EST (8 am to 8 pm EDT) for the TODAY, TONIGHT and TOMORROW periods. The minimum temperature is for 7 pm to 7 am EST (8 pm to 8 am EDT) for the TONIGHT period.

e) WIND - DIRECTION AND SPEED

The wind direction applies to the direction from which the wind will blow. The direction will be listed using the 8 point compass (e.g. NE, SE, SW, etc.). The wind speed will be given in miles per hour (mph). The speed, calculated over successive 2 minute averages, is forecasted for the standard 20 foot level. All

wind forecasts are the average wind speed and corresponding wind direction for each twelve hour period. Significant winds gusts of 25 mph or more will be mentioned in the remarks section of each zone. The fire weather zone formatter will allow a delineation of AM vs PM winds in the day periods of the fire weather forecast, with sudden short term winds changes addressed in the remarks portion of each zone.

f) PRECIPITATION AMOUNT/DURATION/BEGIN-END TIMES

Precipitation amount will be given in hundredths of an inch for each period a chance of precipitation is forecasted. The amount forecasted will be given in incremental ranges. Generally, if the chance of rainfall is less than 60% for an individual period, the forecast rain amount will not exceed the 0.01 to 0.10 inch category, An exception to this rule is when scattered (50 percent or less coverage) showers (thunderstorms) are capable of producing localized higher category rainfall amounts; in which case, the remarks section will state most locations will receive little if any rainfall.

The precipitation duration number represents the duration of precipitation in hours for each period. Use of the word "continuing" implies precipitation extending from one period to the next. For the purpose of the fire weather zones, the day period is defined from 7 am to 7 pm and the night period as from 7 pm to 7am local time. Note that if the showers (thunderstorms) are forecast, duration will be less than the total time between start and end times, since showers and thunderstorms are defined to be intermittent periods of precipitation.

g) RELATIVE HUMIDITY

The relative humidity is the ratio, in percent, of the amount of moisture in the air compared to the amount the air could hold if fully saturated (i.e. 100%). The range is from 0% to 100%.

Usually, the minimum relative humidity occurs at the time of maximum temperature and the maximum relative humidity occurs at the time of the minimum temperature. Because of the dependency of the relative humidity upon temperature, it should be noted that if the temperature is under (over) forecast, then the relative humidity forecast will be too high (low).

h) HAINES INDEX

The Haines Index (HI) is a measure of the lower atmosphere stability, used for fire weather use. It is used to indicate the potential for wildfire growth by measuring the stability and dryness of the air parcel over the fire. It is calculated by combining the stability and moisture content of the lower atmosphere into a number that correlates well with large fire growth. The stability term is determined by the temperature difference between two atmospheric layers; the moisture term is determined by the temperature and dew point difference. This index has been show to correlate with large fire growth on initiating and existing fires where surface winds don't dominate
fire behavior. The HI can range from 2 to 6. The drier and more unstable, the higher the number.

HI	POTENTIAL
2	VERY LOW (MOIST STABLE LOWER ATMOSPHERE)
3	VERY LOW
4	LOW
5	MODERATE
6	HIGH POTENTIAL (DRY UNSTABLE LOWER ATMOSPHERE)

i) LIGHTNING FREQUENCY

A forecast interval of the number of cloud to ground lightning strikes expected with thunderstorms (when thunderstorms are forecasted).

j) MIXING HEIGHT

Mixing heights represent the top of the layer through which relatively vigorous mixing will take place. It is the height at which smoke will lose its buoyancy and stop rising. A well mixed layer in the atmosphere in which the lapse rate is roughly dry adiabatic (5.5 degrees Fahrenheit per 1000 ft). Mixing heights commonly go through large diurnal variations and seasonal variations.

k) TRANSPORT WINDS, VENTILATION AND SMOKE DISPERSION

Transport wind is the mean wind speed in mph and direction from the surface to the height of the mixing layer. Ventilation is the mixing layer height multiplied by the transport wind speed. Smoke dispersion is directly related to the ventilation.

100000 and up.....EXCELLENT
61000 TO 10000.....GOOD
41000 TO 60000.....AVERAGE
21000 TO 40000.....FAIR
20000 OR LESS.....POOR

l) REMARKS

Any pertinent information best relayed in a narrative format, may be included in the remarks section. Timing of the sea-breeze, and specific information wind gusts may be included.

4.3 Dissemination

The Fire Weather Forecast will be available on the Internet through the Gray homepage daily during the fire weather season by 600 am. The Fire Weather Forecast will also be sent on the AWIPS system under the WMO header FXUS7 KGYX. The internet addresses is:

Gray ME	http://www.nws.noaa.gov/er/gyx
Caribou ME	http://www.nws.noaa.gov/er/car
Taunton MA	http://www.nws.noaa.gov/er/box

5.0 Spot Forecasts for Wildfire Support

The spot forecast is a site-specific, localized weather forecast available for wildfire support. This product includes a forecast of wind, temperature, humidity and any effects local topography will have on the weather. The parameters forecast should be the worst case scenario expected.

When requests for special spot forecasts from forest agencies arrive via internet, phone or fax, complete the forecast online (preferably), or fill out the form located in the blue fire weather binder. Then issue the forecast to the requesting agency within 30 minutes of their original request time. If the forecast request is received on our web page, then fill out the forecast parameters online and send back via the internet. The following information must be exchanged when a spot forecast is requested:

1) The name of the agency.
2) Time, location and size of the fire.
3) Elevation/Geography/Topography.
4) Current weather observation.
5) Any additional information that would help the forecaster.

The duty forecaster will provide the following:

1) Time period of the forecast (usually 12 hours)
2) Brief synopsis.
3) Temperature forecast.
4) Relative Humidity forecast (minimum during the day, maximum at night).
5) Wind direction and speed at 20 foot level. State height if other than 20 ft level and any timing of wind changes if possible.
6) Probability of precipitation.
7) Mesoscale features associated with thunderstorms/fronts.
8) Other weather phenomena deemed important.

6.0 Red Flag Warnings and Fire Weather Watches

Both of the following conditions are generally needed to meet Red Flag criteria. Red Flag warnings and watches will be coordinated with the Maine and New Hampshire Forest Service.

1) Forest fuel condition favorable for burning.

This shall be coordinated with the Maine and New Hampshire Forest Service. Additional contact information is available on the intranet page.

2) Weather conditions favorable for burning.

Red Flag Warning Guidance

Wind	10 – 15 mph	15 – 20 mph	20 – 30 mph	>30 mph
RH 30% to 35%				W
RH 25% to 30%			W	W
RH 20% to 25%		W	W	W
RH < 20%	W	W	W	W

Note: 20 Ft Wind Speed (Sustained, but consider frequent gusts).

6.1 Definitions

Fire Weather Watch - is used to alert the user of the possible development of a Red Flag event from 12 to 36 hours in advance (with longer watch times possible in the event of an upcoming holiday). A fire weather watch may be issued within 12 hours for the very rare occurrence of dry thunderstorms.

Red Flag Warning - will be issued to warn users of an impending or on-going Red Flag event. A Red Flag Warning will be issued for impending Red Flag conditions when there is a high degree of confidence that conditions will develop and the forecast time of onset for the event is less than 24 hours from the forecast issuance time.

If a Fire Weather Watch or Red Flag Warning is issued, it will be included as a headline in the Fire Weather Forecast (PWMFWFGYX) above the synopsis. Also a statement PWMRFWGYX will be issued. Fire Weather Watches or Red Flag Warnings, however, will not be highlighted in corresponding public zone forecasts (PWMZFPGYX).

Because of the restrictions on user programs brought about by a Red Flag Warning, it is imperative that the warning be promptly cancelled when the conditions cease to exist or if the conditions are no longer expected to develop. A statement (PWMRFWGYX) will be issued to cancel the Red Flag Warning or Fire Weather Watch. Also, the Red Flag Warning and Fire Weather Watch may be issued after the routine issuance, If this happens, the Fire Weather Forecast will need to be updated to include the headline.

Only the Fire Weather Watch should be in effect for longer than the valid time of the forecast. A Fire Weather Watch can be in effect for up to 72 hours in the forecast and an RFW issued.

EXAMPLES:

ZCZC PWMRFWPWM
RED FLAG WATCH
NATIONAL WEATHER SERVICE GRAY ME
400 AM EST MON MAR 5 2007

...RED FLAG WATCH FOR TOMORROW FOR SOUTHWESTERN MAINE AND ALL BUT
SOUTHWEST NEW HAMPSHIRE...

.THE PASSAGE OF A COLD FRONT WILL CAUSE WINDS TO PICK UP TOMORROW. DRY
AIR BEHIND THE FRONT WILL ALSO CAUSE RELATIVE HUMIDITIES TO DROP POSSIBLY
RESULTING IN DANGEROUS FIRE BEHAVIOR.

MEZ-009-062100-
/O.NEW.KGYX.FW.W.0001.070306T0900Z-070306T2100Z/
CENTRAL SOMERSET-
400 AM EST MON MAR 5 2007

...RED FLAG WATCH IN EFFECT TUESDAY MORNING THROUGH LATE AFTERNOON...

THE NATIONAL WEATHER SERVICE IN GRAY HAS ISSUED A RED FLAG WATCH FOR
TUESDAY.

A RED FLAG WATCH MEANS THAT A COMBINATION OF STRONG WINDS AND DRY CONDITIONS
MAY OCCUR SOON. THESE CRITIAL FIRE WEATHER CONDTIONS MAY RESULT IN DANGEROUS
FIRE BEHAVIOR.

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ZCZC PWMRFWPWM
RED FLAG WARNING
NATIONAL WEATHER SERVICE GRAY ME
400 AM EST MON MAR 5 2007

MEZ-009-052100-
/O.NEW.KGYX.FW.W.0001.070305T0900Z-070305T2100Z/
CENTRAL SOMERSET-
400 AM EST MON MAR 5 2007

...RED FLAG WARNING IN EFFECT FROM NOON TODAY TO 700 PM EDT THIS EVENING...

THE NATIONAL WEATHER SERVICE IN GRAY HAS ISSUED A RED FLAG WARNING... WHICH IS IN EFFECT FROM NOON TODAY TO 700 PM EDT THIS EVENING.

NORTHWEST WINDS WILL INCREASE TO 20 TO 30 MPH THIS AFTERNOON...WITH GUSTS UP TO 40 MPH. MEANWHILE...RELATIVE HUMIDITIES WILL DROP TO 20 TO 25 PERCENT.

A RED FLAG WARNING MEANS THAT A COMBINATION OF STRONG WINDS AND DRY CONDITIONS IS OCURRING NOW...OR WILL OCCUR SOON. THESE CRITIAL FIRE WEATHER CONDTIONS MAY RESULT IN DANGEROUS FIRE BEHAVIOR. FOR FURTHER INFORMATION CONTACT YOUR LOCAL FIRE OFFICIALS.

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CANCELLATIONS

ZCZC PWMRFWGYX
TTAA00 KGYX 081100
UGC CODE-EXPIRATION TIME

RED FLAG WARNING/CANCELLATION
NATIONAL WEATHER SERVICE GRAY ME
700 AM EDT FRI OCT 9 2005

...THE RED FLAG WARNING FOR ALL BUT SOUTHWESTERN NEW HAMPSHIRE HAS BEEN CANCELLED...

TEXT

Summary of what to do if we need to issue a Fire Weather Watch/Red Flag Warning

1) If a Fire Weather Watch or Red Flag Warning is needed for any portion of our CWA, call and coordinate with appropriate forest agency. Also coordinate with appropriate adjacent forecast offices

2) Issue the RFW.

3) Update the FWF to include the watch or warning as a headline (Headline does not go into zones).

4) You do not need to issue another RFW when the watch/warning expires on its own.

7.0 Afternoon Point Forecasts

An afternoon point forecast for North Conway NH will be composed daily and disseminated by 330 pm under the PWMFWMGYX header. The format for this product is as follows:

FCST,XXXXXX,YYMD,13,X,TT,RH,L1,L2,DD,SS,,TX,TN,RH,RN,P1,P2,F

Where: XXXXXX is the forecast point
YYMD is the year, month and day of the forecast.
13 is local time (does not change).
X is a weather code: 0 = clear, 1 = scattered clouds (mostly clear), 2 = broken clouds partly to mostly cloudy), 3 = overcast, 4 = fog, 5 = drizzle, 6 = rain, 7 = snow/sleet, 8 = showers and 9 = thunderstorms.
TT is a 21 hour - 1300 LT temperature forecast
RH is a 21 hour- 1300 LT relative humidity forecast
L1 and L2 are lightning activity levels (LAL's) for 1300-0600 LT and 0600-1300 LT respectively code: 1 = none, 2 = 1-8 strikes, 3 = 9-15 strikes, 4 = 15-25 strikes, 5 > 25 strikes, 6 = scattered dry thunderstorms (very rare).
DD is wind direction using 8 - point compass headings
SS is 20 or 30 foot wind speed (10 minute average in mph).
TX is a 24 hour maximum temperature forecast
TN is a 24 hour minimum temperature forecast
RX is a 24 hour maximum relative humidity forecast
RN is a 24 hour minimum relative humidity forecast
P1 is precipitation duration (1300-0600 LT period) in hours
P2 is precipitation duration (0600-1300 LT period) in hours
F is a Y/N flag for widespread wetting rains (average of 0.25+ inch)

In addition, the National Fire Danger Rating System (NFDRS) and drought indices such as CPC's Drought Monitor should be reviewed daily to monitor the dryness of ground fuels. The categories of concern are high through extreme for the NFDRS and D2 through D4 for the drought Monitor. Should the fire danger category reach or exceed the high category for any zones and relative humidity and wind conditions are expected to meet watch/warning criteria within the first 3 days of the fire weather forecast, consider whether fire weather watches/red flag warnings are needed.

Dissemination (as well as composition) of the NFDRS rating will be done on the IFPS/GFE formatter under the heading PMWFWMGYX.

8.0 NOAA Weather Radio

Most of Maine and New Hampshire are covered by the NOAA All Hazard Radio network. These 24 hour broadcasts provide continuous up to date weather information directly from the NWS. Automated weather messages are repeated every 5 to 10 minutes, and are routinely revised as needed. The broadcasts are tailored to the weather needs of the people within the receiving area. These broadcasts can usually be heard as far as 40 miles or more from the antenna site depending on the terrain, atmospherics, receiver quality and other factors.

NOAA Weather Radio Transmitter Sites

Site Name	Location	Call Sign	Frequency
Blackstrap	Falmouth, ME	KD095	162.550 Mhz
Blinn Hill	Dresden, ME	WSM60	162.475 Mhz
Mt Washington	Sargent's Purchase, NH	KZZ41	162.500 Mhz
Plausea Hill	Pembroke, NH	CCRN3	162.400 Mhz
Saddleback	Deerfield, NH	KZZ40	162.450 Mhz
Moose Mountain	Hanover, NH	WNG546	162.450 Mhz
Mt Prospect	Holderness, NH	WNG545	162.525 Mhz
Sugarloaf Mountain	Carrabasset Valley, ME	SLGM1	162.450 Mhz
Ben Young Hill	Clarksville, NH	BYHN3	162.400 Mhz

9.0 Surface Observations

The following sites can be accessed via the internet on the Gray homepage, 24 hours a day, when available.

Surface Observation Sites in the Gray Forecast Area

Site	ID	Type
Augusta, ME	AUG	ASOS
Berlin, NH	BML	ASOS
Brunswick, ME	NHZ	Military
Concord, NH	CON	ASOS
Fryeburg, ME	IZG	ASOS
Laconia, NH	LCI	AWOS
Lebanon, NH	LEB	ASOS
Lewiston/Auburn, ME	LEW	AWOS
Plymouth, NH	1P1	ASOS
Portland, ME	PWM	ASOS
Portsmouth, NH	PSM	Military
Rochester, NH	DAW	ASOS
Rockland, ME	RKD	AWOS
Sanford, ME	SFM	AWOS
Waterville, ME	WVL	AWOS
Whitefield, NH	HIE	ASOS
Wiscasset, ME	IWI	ASOS

Automated Surface Observing System (ASOS) are owned and maintained by the NWS and report complete weather observations 24 hours a day. They can be accessed via the internet on the Gray homepage. The sites listed below are located within the Gray CWA.

Automated Weather Observations (AWOS), maintained by the Federal Aviation Administration (FAA) provide weather reports (no current weather is available on AWOS sites).

The military also takes observations available to the public.

10.0 Air Transportable Mobile Unit Support

Large wildfires in the CWA may require an incident response. If the situation should arise. the appropriate agency would request an Air Transportable Mobile Unit (ATMU). A request for this unit shall be done through the U.S. Forest Service Eastern Area Coordination Center in Milwaukee WI. The phone number for the Coordination Center is 414-297-3690 or 3777.

The ATMU consists of four modules with a combined weight of 300 pounds. A separate MicroREMS (Remote Environmental Monitoring System) unit should be requested. The ATMU provides the equipment and supplies for field meteorological operations. The user agency must provide a relatively clean and dry working environment as well as a normal electric power supply. A static free phone line is also required.

The local user agency requesting the on-site forecast service has the primary responsibility for paying for the transportation of the ATMU unit and the ATMU meteorologist to and from the incident. The cost can be as high as $350 a day.

11.0 Requests for Historical Weather Information

Agencies requiring historical weather information for specific locations should contact the appropriate NWS office. If the requested historical information is available, the NWS will disseminate the information. For large data requests, or if the data is unavailable, the user will be directed to either a regional or national climatic data source.

12.0 Points of Contact

Federal Agencies

White Mountain National Forest
300 Glen Road
Gorham, NH 03581

Contacts:

Donald Muise, FMO
Phone: 603-466-2713 Ext 214
Fax: 603-466-2856
E-Mail: dmuise@fs.fed.us

Marsha Smith, Weather Coordinator (Located in Conway NH)
Phone: 603-447-2166 Ext 108
E-mail: mmsmith@FS.FED.US

State Agencies

Maine Forest Service
2870 N. Belfast Ave
Augusta ME 04330

Contacts:

Mike Ricci (District Ranger)
Phone: 207-827-1808

Bill Williams (State Forest Fire Supervisor)
Phone: 207-287-4991

David Hilton (Bolton Hill office)
Phone: 207-624-3700
Fax: 207-287-8534
E-mail: david.hilton@maine.gov

Gregg Hesslein
District Forest Ranger
Maine Forest Service
356 Shaker Road
Gray, Maine 04039

Phone: 207-657-3552
Fax: 207-657-5070
E-mail: gregg.hesslein@maine.gov

New Hampshire Forest Service
PO BOX 1856
Concord, NH 03302-1856

Contacts:

Neil Bilodeau
Phone:
E-mail: nbilodeau@dred.state.nh.us

Bob Stewart (NH Fire Weather Focal Point)
Phone: 603-271-2214
Emergency: 603-863-6603
E-mail: rstewart@dred.state.nh.us

Brad Simpkins (NH Chief of Fire Protection)
Phone: 603-271-2217
Fax: 603-271-6488
E-mail: bradsimpkins@dred.state.nh.us

National Weather Service

WFO Gray, Maine
1 Weather Lane
Gray, ME 04039

Contacts:

Kirk Apffel
Phone: 207-688-4170
E-mail: Kirk.Apffel@noaa.gov
Fax: 207-688-3230

WFO Caribou, Maine
810 Main St
Caribou, ME 04736

Contacts:

Mark Bloomer
Phone: 207-492-0166
E-mail: Mark.Bloomer@noaa.gov

WFO Taunton, Massachusetts
445 Myles Standish Blvd
Taunton, MA 02780

Contacts:

Hayden Frank
Phone: 508-828-2672
E-mail: Hayden.Frank@noaa.gov

NWS Regional Headquarters
Airport Corporate Center
630 Johnson Ave
Bohemia, NY 11716

Contacts:

Harvey Thurm
Phone: 516-244-0124
E-mail: Harvey.Thurm@noaa.gov
Fax: 516-244-0167